

vehicle 1210 may be connected to an on-board computer or otherwise to a network-based computing device to enable the augmented reality device to generate the augmented reality environment by rendering three-dimensional virtual objects to appear as though they are placed within the setting of the real world seen through the windshield.

[0239] In particular embodiments, the vehicle subsystem 1208 may further include a sensor suite. For example, the sensor suite can be mounted on the top of the vehicle subsystem 1208 or else can be located within the interior of the vehicle subsystem 1208. In certain embodiments, the sensor suite can be located in multiple areas at once—i.e., split up throughout the vehicle subsystem 1208 so that different components of the sensor suite can be placed in different locations in accordance with optimal operation of the sensor suite.

[0240] In particular embodiments, the sensor suite can include a LIDAR and an inertial measurement unit (IMU) including one or more accelerometers, one or more gyroscopes, and one or more magnetometers. The sensor suite can additionally or alternatively include a wireless IMU (WIMU), one or more cameras, one or more microphones, or other sensors or data input devices capable of receiving and/or recording information relating to navigating a route to pick up, transport, and/or drop off a passenger.

[0241] In the foregoing specification, the invention has been described with reference to specific exemplary embodiments thereof. Various embodiments and aspects of the invention(s) are described with reference to details discussed herein, and the accompanying drawings illustrate the various embodiments. The description above and drawings are illustrative of the invention and are not to be construed as limiting the invention. Numerous specific details are described to provide a thorough understanding of various embodiments of the present invention.

[0242] The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. For example, the methods described herein may be performed with less or more steps/acts or the steps/acts may be performed in differing orders. Additionally, the steps/acts described herein may be repeated or performed in parallel with one another or in parallel with different instances of the same or similar steps/acts. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed is:

1. A method comprising:

analyzing, by a transportation system comprising at least one processor, historical information for an area associated with a passenger waiting for pickup, the historical information comprising information for a plurality of past rides having pickup locations within the area associated with the passenger waiting for pickup;

identifying, based on the analyzed historical information, an ideal pickup location within the area associated with the passenger;

generating, for the identified ideal pickup location, an augmented reality element corresponding to a real-world environment surrounding the passenger and indicating the ideal pickup location; and

providing, to the passenger by way of an augmented reality device, the generated augmented reality element.

2. The method of claim 1, further comprising:

identifying a driver assigned to the passenger;

generating an augmented reality element corresponding to a real-world environment surrounding the driver and indicating the ideal pickup location; and

providing, to the driver by way of an augmented reality device associated with the driver, the generated augmented reality element corresponding to the real-world environment surrounding the driver.

3. The method of claim 1, wherein the historical information further comprises one or more of historical traffic information or previous pickup location requests from previous passengers.

4. The method of claim 1, further comprising determining a passenger pickup location route to guide the passenger to the ideal pickup location based on one or more of the historical information for the area associated with the passenger, a driver location, or a passenger location.

5. The method of claim 4, further comprising:

determining, based on the historical information, a plurality of maneuvers within the passenger pickup location route for guiding the passenger to the ideal pickup location; and

providing, to the augmented reality device and for each of the plurality of maneuvers, an augmented reality maneuver element.

6. The method of claim 5, further comprising:

identifying, based on the historical information and further based on the driver location and the passenger location, a plurality of possible pickup locations for the passenger;

ranking each of the plurality of possible pickup locations according to one or more factors;

determining, based on the ranking of the plurality of possible pickup locations, which of the plurality of possible pickup locations is the ideal pickup location; and

providing, to the augmented reality device, a coordinate location of the ideal pickup location for overlaying the generated augmented reality element at the coordinate location within a display of the real-world environment.

7. The method of claim 6, wherein the one or more factors comprise one or more of a distance between the passenger and each of the plurality of possible pickup locations, a distance between a driver of a transportation vehicle assigned to pick up the passenger and each of the plurality of possible pickup locations, an estimated travel time for the passenger to navigate to each of the plurality of possible pickup locations, or an estimated travel time for the driver to navigate to each of the plurality of possible pickup locations.

8. The method of claim 1, wherein the historical information further comprises an indication from previous passengers or previous drivers of one or more no pickup locations.

9. The method of claim 8, further comprising providing, to the augmented reality device and based on the historical information, a coordinate location of the one or more no pickup locations for overlaying an augmented reality no